

Abstract

A mesh generation tool that is programmatically integrated with a system-level design and simulation environment, thereby enabling the direct generation of PDE solver input from a system-level design and simulation environment and a method for using the mesh generation tool are disclosed. Automatic mesh generation and optimization is improved by making available additional information about the nature and purpose of certain design components to the mesh generation tool. Specifically, the parameters of the components in the device schematic, which represent a user-defined decomposition of a larger MEMS design into smaller entities of clear physical purpose, are made available to the mesh generation tool. The link established between the system-level design and PDE analyses allows the user to move between the two levels of abstraction. The mesh generation tool retrieves information from the components and connectors of a schematic of a MEMS device, and produces a discrete element model suitable for numerical PDE analysis by the finite element (FEM) and boundary element (BEM) methods. A direct link from a schematic model to a mesh model helps the user to produce an optimal mesh for PDE analysis, thereby avoiding considerable unnecessary computation.